



Australian Bureau of Statistics

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Summary

Main Features

INTRODUCTION

BACKGROUND

REASON FOR 2008-09 SAMPLE REDUCTION

IMPLEMENTATION

EXPECTED SAMPLE SIZE

NEW SAMPLING FRACTIONS

IMPACT ON QUALITY OF ESTIMATES

IMPACT ON LFS PRODUCTS

IMPACT ON ASSOCIATED SURVEYS

METHODOLOGICAL CHANGES

MORE INFORMATION

INTRODUCTION

A note in the April to June 2008 issues of **Labour Force, Australia** (cat. no. 6202.0) advised of forthcoming changes to the Labour Force Survey (LFS) sample.

This second edition of **Information Paper: Labour Force Survey Sample Design, November 2007** (cat. no. 6269.0) provides consolidated information about those changes. There is to be a 24% reduction in the size of the LFS sample which is being implemented in the July 2008 survey month. The statistics from the July 2008 survey will be released on 7 & 14 August 2008.

This edition contains:

- the reason for the reduction in sample size;
- the expected sample size in July 2008;
- the new sampling fractions for July 2008 onwards;
- the impact of the reduced sample size on the quality of the estimates;

- the impact of the reduced sample size on LFS products;
- the impact of the reduced sample size on associated surveys; and
- information on some of the methodological changes resulting from the reduced sample size.

BACKGROUND

Following the completion of the five yearly Census of Population and Housing, the ABS reviews the LFS sample design. The review ensures that the survey accurately reflects the geographical distribution of the Australian population, and remains efficient and cost-effective.

The review based on 2006 Census data was completed in 2007 and the new sample design was implemented over the period November 2007 to June 2008. In developing the 2006 sample design, the ABS decided to offset increased operational costs by taking advantage of the sampling efficiencies resulting from the introduction of a new estimation method (for details of this method refer to **Information Paper: Forthcoming Changes to Labour Force Statistics, 2007** (cat. no. 6292.0)). This enabled an 11% reduction in the LFS sample size with only minor reductions in data quality relative to the previous design. Full details of the 2006 sample design are presented in the first edition of **Information Paper: Labour Force Survey Sample Design, November 2007** (cat. no. 6269.0).

REASON FOR 2008-09 SAMPLE REDUCTION

The ABS is facing a tight budget situation in 2008-09. As a result, the ABS has identified a number of savings initiatives for 2008-09 to ensure it can deliver its work program within its allocated budget. One of the saving initiatives is to reduce the LFS sample size in 2008-09. There will be a 24% reduction in the July 2008 LFS sample size relative to the June 2008 sample size. This sample reduction is being implemented in such a way that the sample can easily be increased in the future (should the ABS funding position change).

[Back to top](#)

IMPLEMENTATION

The ABS will implement the full sample reduction in July 2008 in order to maximise savings in 2008-09. As a consequence of implementing the full reduction in a single month, there will be less common sample between July 2008 and the previous month June 2008. Hence, the standard error on June-July movement estimates will be slightly larger than if the reduction had been phased-in over several months.

EXPECTED SAMPLE SIZE

Table 1 shows the actual number of persons in the LFS sample for June 2008 under the 2006 sample design and the expected number for July 2008 following the sample reduction. The sample reduction is expected to result in about 41,900 persons responding to the survey in July 2008, covering about 1 in 409 (0.24%) of the population aged 15 years and over.

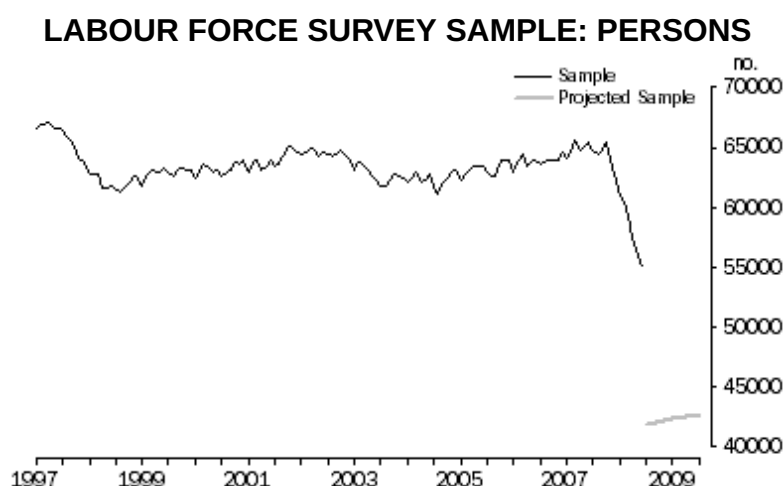
TABLE 1. FULLY RESPONDING PERSONS

	June 2008 actual	July 2008 expected(a)
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New South Wales	13 000	9 900
Victoria	11 300	8 600
Queensland	9 700	7 400
South Australia	6 400	4 900
Western Australia	6 300	4 800
Tasmania	3 600	2 800
Northern Territory	2 300	1 800
Australian Capital Territory	2 200	1 700
Australia	54 900	41 900

(a) These figures differ from those published in the April 2008 issue of Labour Force, Australia (cat. no. 6202.0) because they have now been derived from actual rather than expected fully responding persons for June 2008.

It should be noted that the sample size will gradually increase after July 2008 due to population growth until the next sample redesign (following the 2011 Census). The graph shows the number of persons enumerated in the LFS sample from 1997 to June 2008, and the expected sample size in July 2008 following the sample reduction and thereafter (the grey line). The graph illustrates the gradual increase in the number of persons enumerated between each redesign, and the decrease in sample size following the 1996, 2001 and 2006 Census redesigns.



NEW SAMPLING FRACTIONS

Table 2 shows the state and territory sampling fractions from the 2006 sample design and following the July 2008 sample reduction. Both sets of sampling fractions were an output from the 2006 sample design process. Table 2 also shows the sampling fractions from earlier sample designs.

TABLE 2. SAMPLING FRACTIONS, By year of redesign and July 2008

	1976	1981	1986	1991	1996	2001	2006	July 2008
New South Wales	1 in 200	1 in 200	1 in 230	1 in 277	1 in 300	1 in 321	1 in 380	1 in 499
Victoria	1 in 200	1 in 200	1 in 230	1 in 242	1 in 257	1 in 270	1 in 336	1 in 441
Queensland	1 in 140	1 in 140	1 in 160	1 in 195	1 in 222	1 in 239	1 in 315	1 in 415
South Australia	1 in 100	1 in 100	1 in 115	1 in 139	1 in 147	1 in 149	1 in 184	1 in 241
Western Australia	1 in 90	1 in 100	1 in 115	1 in 146	1 in 160	1 in 165	1 in 246	1 in 324
Tasmania	1 in 60	1 in 60	1 in 70	1 in 75	1 in 83	1 in 90	1 in 103	1 in 135
Northern Territory	1 in 100	1 in 100	1 in 115	1 in 75	1 in 85	1 in 98	1 in 54	1 in 68
Australian Capital Territory	1 in 100	1 in 100	1 in 115	1 in 75	1 in 85	1 in 86	1 in 117	1 in 154

IMPACT ON QUALITY OF ESTIMATES

The new LFS sample, while smaller, will still be representative of the geographic distribution of the Australian population. There will be increased volatility in the estimates, particularly the original and seasonally adjusted estimates, but this volatility will be random. The ABS continues to encourage users to focus on the trend estimates because the increased volatility seen in the original and seasonally adjusted estimates will be dampened through the 'trending' process.

The most common way to quantify the volatility is to examine the relative standard errors (RSEs). Table 3 shows the target RSEs for the 2006 sample design and the target RSEs for the sample from July 2008.

TABLE 3. LFS RELATIVE STANDARD ERRORS

	EMPLOYMENT RSE (%)		UNEMPLOYMENT RSE (%)	
	2006 Target RSE(a)	2008 Target RSE	2006 Target RSE(a)	2008 Target RSE
New South Wales	0.8	0.9	5.0	5.7
Victoria	0.8	0.9	5.3	6.1
Queensland	0.9	1.0	5.7	6.6
South Australia	1.1	1.3	6.8	7.7
Western Australia	1.0	1.1	7.1	8.1
Tasmania	1.5	1.7	8.3	9.5
Northern Territory	2.6	3.0	13.4	15.1
Australian Capital Territory	1.3	1.5	13.9	16.0
Australia	0.4	0.4	2.6	2.9

(a) Due to recent improvements in the RSE estimation method, the 2006 RSEs for the NT and also for unemployment in SA differ from those published in the information paper Labour Force Survey Sample Design, November 2007 (cat. no. 6269.0).

Overall, the RSEs for estimates of employment and unemployment at the national, state and territory level are expected to be approximately 15% higher on average than those expected from the 2006 sample design. The impact of the increased RSEs is best demonstrated by consideration of the confidence intervals surrounding the respective estimates. By way of example, say the national estimate for employment is 10,000,000. If this figure were produced under the 2006 design, there would be 19 chances in 20 that the real value is within the range 9,932,600 to 10,067,400. With the reduction in sample from July 2008 that range will increase to 9,922,800 to 10,077,200. Similarly for unemployment, if for example a national estimate of 500,000 was produced under the 2006 design, there would be 19 chances in 20 that the real value is within the range 474,000 to 526,000. With the reduction in sample that range will increase to 470,200 to 529,800.

IMPACT ON LFS PRODUCTS

Key monthly estimates from the LFS are published in **Labour Force, Australia** (cat. no. 6202.0). As well, more detailed estimates from the LFS are presented in a range of products which are available on the ABS website <www.abs.gov.au>.

The sample reduction will increase the standard errors on **all** estimates in these products. The increases will be evident in the July 2008 issue of these products (released on 7 & 14

August 2008). The standard errors for key monthly estimates and detailed estimates are expected to be approximately 15% higher than those expected from the 2006 sample design. Some of the detailed estimates have always had high standard errors, for example, industry estimates for small states and territories, and estimates for some dissemination regions. The sample reduction will increase the number of estimates with high standard errors (ie. subject to sampling variability too high for most practical purposes).

Standard errors for the LFS are statistically modelled as a function of the estimate itself. The ABS will modify those standard error models to take account of the sample reduction. The modified models will be used to populate the standard error tables in **Labour Force, Australia** (cat. no. 6202.0) and to annotate those estimates with an RSE of 25% or higher. Estimates with an RSE of 25% or higher should be used with caution. The modified models will also be incorporated in the product **Labour Force Survey Standard Errors, Datacube, 2007** (cat. no. 6298.0.55.001). This product, which allows users to calculate the standard error for any LFS estimate, will be released on 7 August 2008.

IMPACT ON ASSOCIATED SURVEYS

The sample reduction will also affect the supplementary surveys which are conducted on part of the LFS sample. Each supplementary survey covers a different topic and is conducted infrequently. Due to their infrequency, these surveys do not benefit from the efficiency gains associated with composite estimation. Therefore, the sample reduction associated with the 2006 sample design resulted in increased standard errors for the estimates from these surveys. The sample reduction being implemented in July 2008 will further increase the standard errors for these estimates. In combination, the two sample reductions are expected to increase the standard errors for estimates from the supplementary surveys by approximately 22% relative to the 2001 sample design. As a consequence, the ABS will determine the appropriate level of disaggregation of estimates from each survey at the time the survey results are being prepared for publication. It is likely that the level of disaggregation will need to be reduced, especially for supplementary surveys which relate to small sub-populations.

The ABS also conducts a multi-purpose household survey on part of the LFS sample. The ABS has decided to maintain this survey's sample size. Under the 2001 sample design, this survey sampled one-third of those dwellings in the LFS for the last time (that month), resulting in a sample over the year of 13,500 dwellings. Following the LFS sample reduction in July 2008, the proportion of dwellings sampled will be increased to 50% of those in the LFS for the last time (that month). This proportion is expected to achieve a sample size of 13,000 dwellings per year. Therefore, the ABS expects the sample reduction to the LFS to have a minimal impact on this survey.

[Back to top](#)

METHODOLOGICAL CHANGES

LFS estimates are calculated in such a way as to add up to independent estimates of the civilian population aged 15 years and over (population benchmarks). Two sets of population benchmarks are used in producing LFS estimates. The first set of benchmarks are population estimates split by state or territory, capital city or balance of state, sex and age. There are 20 age groups in all; single year groups for those aged 15 to 24, 5 year groups for those aged 25 to 69 and a final group for those aged 70 and over. The second set of benchmarks are population estimates split by LFS Statistical (Dissemination) Region and sex.

The weighting methodology used in the LFS requires at least one respondent in each benchmark cell. The ABS has undertaken an investigation to determine the likelihood of there being no respondents in any of the benchmarks cells, given the reduced sample size which will be in place from July 2008.

This investigation found that, given the reduced sample size, there would be a relatively high chance of this occurring in the single year age groups (i.e. 15 to 24 years) for balance of South Australia, balance of Western Australia and the city of Hobart. Therefore, the ABS has decided to combine some age groups in these areas to significantly lower the likelihood of there being no respondents in these benchmark categories.

The collapsing of age groups will mean:

- for the balance of South Australia and Western Australia, the single year age groups between 18 and 24 will be replaced by three age groups: 18-19, 20-21 and 22-24; and
- for Hobart, the single year age groups between 22 and 24 will be replaced by one age group: 22-24.

The decision was made to group the ages together in this way as it keeps the 15 to 19 and 20 to 24 year old age groups separate. This was done because several LFS products are released with that disaggregation.

There will be no other changes to the benchmarks used for other States or Territories or to the age groups used for those aged 25 and above.

The ABS currently releases some products with single year of age data for those aged 15 to 24 years old. The ABS will continue to release all products which contain single year of age data. The quality of these data will be slightly reduced due to the single year of age data no longer being benchmarked in all areas.

MORE INFORMATION

For full details of the LFS 2006 sample design, including a list of the LFS Statistical (Dissemination) Regions, refer to the first edition of **Information Paper: Labour Force Survey Sample Design, November 2007** (cat. no. 6269.0).

[Back to top](#)

About this Release

The November 2007 edition provides information on changes to the sample used for the Labour Force Survey. Outlines the current sample design used in the survey and changes made to the design over the history of the survey.

The second edition provides supplementary information about a further reduction in the size of the sample which takes effect from the July 2008 survey (statistics released in August 2008).

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